

failure of the removal of teeth, tonsils, and well-established bacterial foci, to stop the pathologic and clinical course of the disease.

(Manuscript written by J. V. B.)

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Whose job is health education? asks Merrill Champion (Publications, Massachusetts Public Health Department), who answers in part:

"When you come to think of it, the success of public health work of every kind depends upon health education. Even the abatement of nuisances is truly successful only if the offender and the public are educated to a higher standard for the future. In this sense, then, everyone engaged in public health work is to a greater or less extent a health educator. It is worth while to enumerate some of those who may with reason be included in the ranks of those teaching health. The health officer surely belongs there as does the public health nurse. The nutritionist, the dental hygienist, the physical educator, the health visitor, the visiting teacher, the right sort of social worker, the physician and the dentist, belong too in the front rank if they can get away from obsessions engendered by previous exclusive attention to pathology. Then, of course, there is the school-teacher, general or special. Lastly, and potentially most important of all, there are the parents.

"This makes a long list. It raises the question whether, with so many sharing the responsibility, failure is likely because of lack of concentration. This criticism would hold good if health education were strictly a matter of the conscious application of approved pedagogical principles. As a matter of fact, however, this is not so. The list of health habits that we can be reasonably sure of is relatively a short one. Probably at least some of the things we have stressed so confidently and dogmatically in the past have only a remote bearing upon health."

What history we have of man is largely a record of discontent. In the main, man's activities are but reactions to his discontent. If and when he becomes contented, he usually goes to sleep. The greatest urge to accomplishment is dissatisfaction with things as they are.—*Canad. M. A. J.*

## THE OUTLOOK FOR THE DIABETIC

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(Continued from February, 1927, Page 182)

*Classification of Supposed Diabetics*—With the help of my student friends, Mr. Alexander Marble and Mr. Richard Middleton of the fourth year class of the Harvard Medical School, I have spent spare summer evenings in personally recording the classification of each one of the diabetics I have seen since 1898. Classification of the diabetic is still puzzling and in fact is quite as difficult as it was years ago. Despite the aid of tests for blood sugar one runs across a great many patients who have lived so long that the disease appears "burned out," and about the only remains of it one finds are the calcified arteries which represent the ashes. An infection will make these latent cases apparent. Then, too, there is another group who evidently have never been severe, very likely were educated in the tenets of the Allen School, originally were fasted for a day or two, and have held to a Spartan régime ever since. These patients usually have a urine which is sugar-free and before a meal the blood sugar is almost normal, and not a few of them show a normal blood sugar following a meal. One hesitates to give a liberal carbohydrate meal, much less a glucose tolerance test, to these "faithful" merely to gratify a classification whim. Then there is the group of patients in whom the disease was diagnosed very, very early, by reliable physicians, was probably unmistakably present, yet actual proof of it is wanting now. Thus a vivacious Miss, whose glycosuria was 1.7 per cent in my own laboratory when I first saw her in 1919 and later decreased to the merest trace with diet, came to my office this month. When her diabetes was detected in 1917 by the late Doctor Koplik, whose name we all recognize, he kept her out of school for a year and the sugar fell to a mere trace. For the following four years she was on a rigid diet, but now before lunch the blood sugar is 0.10 per cent, and one hour after a characteristic boarding school girl's lunch of a chicken salad sandwich, hot chocolate, ice cream with fudge marshmallow, it rose to but 0.12 per cent. Is she, was she a diabetic or a renal glycosuric? These baffling situations arise in selecting the group of true diabetics. After all is said and done, can it be that in the past we have builded better than we knew? Is it not possible that diabetes may "burn out" in the young, as well as in the old, if we allow the element of time to work?

TABLE 6

*True Diabetics*—Time and death are great classifiers, and Table 6 shows this very plainly. The first 1000 supposed diabetics coming for treatment contained 906 true diabetics, but this number has decreased in succeeding thousands so that in the fifth at this writing the true diabetics number 809. As time goes on undoubtedly there will be transfers to the true diabetic group from the other groups, particularly the "unclassified" group. I do not think the group of true diabetics will ever grow as large in the fifth thousand as it was in the first, because

TABLE 6  
CLASSIFICATION OF 5000 SUPPOSED DIABETICS <sup>1</sup>

	TRUE DIABETES				POTENTIAL DIABETES				RENAL GLYCOSURIAS				UNCLASSIFIED			
	Num- ber	Dead	Alive	Un- traced	Num- ber	Dead	Alive	Un- traced	Num- ber	Dead	Alive	Un- traced	Num- ber	Dead	Alive	Un- traced
1 to 1000	906	716	164	26	13	1	12	0	0	0	0	0	81	31	41	9
1001 to 2000	865	510	313	42	11	0	10	1	5	1	3	1	119	14	90	15
2001 to 3000	834	245	515	74	26	2	23	1	15	2	12	1	*125	7	102	16
3001 to 4000	843	157	608	78	42	0	37	5	8	1	6	1	107	5	89	13
4001 to 5000	809	74	677	58	47	0	47	0	13	0	13	0	131	5	117	9
Total	4257	1702	2277	278	139	3	129	7	41	4	34	3	563	62	439	62

\* One diabetes insipidus.

<sup>1</sup> Minor changes in this table must be made later.

it is my impression—and I think the medical directors of insurance companies hold the same opinion—that more doubtful diabetics are coming to light now than ever before. Rarely a case will be transferred from the diabetic group to one of the other groups, but I shall certainly be very cautious before I allow a child to qualify as a diabetic of ten years' duration unless he or she fulfills all the requirements. This table shows that of the true diabetics more than two-thirds are alive, and if I add 500 or 600 recent cases the living percentage will be still higher.

The tracing of diabetics for end results is enticing even if it is as expensive as most sports. So far I have traced 93 per cent of my first 5000 cases and have given up as "untraceable" but 1 per cent. Of the 395 children all have been traced.

By a true diabetic I mean in the first place a patient who shows a considerable glycosuria with a percentage of sugar in the blood of 0.17 per cent or more. In the older cases evidence of considerable sugar in the urine, which was evidently related to diet, justifies the diagnosis, especially when taken in connection with the further history of the case. A normal fasting blood sugar, but with proof of considerable sugar in the urine, varying with the diet, would establish a diabetic's identity, and so would a history of a moderate glycosuria if the fasting blood sugar was 0.14 per cent or above. In any series of 1000 cases one is struck by the number of patients who gave a history of recent onset, yet with repeated questioning symptoms are disclosed which would indicate that the disease had begun in a mild degree years before, but only recently flared up with an infection. Just as the beginning of the disease in this group is easily overlooked, so the end of the disease is overlooked in the "burnt out" cases, because the complications or intercurrent diseases, such as cancer, are so much more important and this displaces diabetes on the death certificate.

**Potential Diabetics**—A potential diabetic is a patient with glycosuria closely related to the diet, who easily becomes sugar-free with slight restrictions and

whose blood sugar is below 0.14 per cent fasting and never reaches 0.17 per cent after a meal. This group is constant in the tabulation for the first and second thousand patients, doubles, trebles, and quadruples for succeeding thousands. In connection with the 395 examples of true diabetes in children some sixty-eight other supposed diabetics were referred to me, and of these fourteen were placed in the group of potential diabetics. Thus far in but one instance has there been evidence that a case once carefully classified as a potential diabetic later became a true diabetic. Possibly case No. 129 as well should be added.

I doubt if this constancy of classification will hold for adults. With the children it is important, because such facts are a comfort to the family and the physician.

The potential diabetics among my first 5000 cases number 139, and of these but three have died and but seven are untraced. It would appear as if a diagnosis of potential diabetes predisposed that individual to health, and that he was a good risk for an insurance company.

**Renal Glycosuria**—Twenty years ago renal glycosurics were rare and I did not recognize one as such in my first 1000 cases which ended in the year 1916. Doubtless a certain number were overlooked. In the second thousand they are represented by five cases and in succeeding thousands the number rises as high as fifteen. The total number for the 5000 is forty-one cases, of whom four are dead and three remain untraced. One of the four cases who died succumbed to an automobile accident while coasting, and the other three to cardiac disease, cirrhosis of the liver, and following a gall bladder operation.

The characteristics of a renal glycosuric are now generally recognized to be (1) a permanent glycosuria, (2) which is largely unrelated to diet, (3) a normal blood sugar, (4) freedom from diabetic symptoms, (5) a duration extending over a period of years.

**Unclassified Diabetics**—Unclassified diabetics in

my classification include all those cases of glycosuria not easily caught in the preceding nets, but especially those cases not previously classified, which are associated with organic disease, for example, of the gall bladder, thyroid, kidney, cancer of the pancreas and often pregnancy, though these latter cases appear to be of varied type and therefore one must not be content to consider them lightly but endeavor to determine whether their glycosuria is that of true diabetes, potential diabetes, renal glycosuria, or merely unclassified. One is struck by the increase of the unclassified group in successive thousands. Thus in the first thousand there were 81, in the second 119 cases, but in the last and most recent thousand where time has not had a chance to show its hand the number is 131. These 562 unclassified cases make a very important group for study. They are a dangerous group. One never rests easy with an unclassified diabetic. Such a diagnosis worries the doctor, annoys the patient and exasperates insurance agents.

*Treatment*—In the treatment of diabetes today I still adhere to each of the ten clauses of my diabetic creed, but with certain modifications and this preamble: Insulin not only allows but demands that the diabetic of today should never be contented with tolerable health, but should have good health. Perhaps I may be permitted to state the creed in abridged form:

I believe (1) that diabetes mellitus should be considered so probable in any person who has 0.1 per cent or more of sugar in the urine that he should be watched for life.

2. That normal weight, or less, should be insisted upon in each diabetic, suspected diabetic, or relative of a diabetic. (Therapeutic loss of weight should invariably be gradual.)

3. That mildness of the diabetes should be assumed and the patient treated accordingly until the contrary is proved. Hence, the nearer the proportions of carbohydrate, protein, and fat in the diabetic diet conform to those of the normal diet always avoiding glycosuria, the better it is for the patient.

4. That reversal of the diet, namely, high fat and low carbohydrate, assumes the contrary, severity of the diabetes, and is dangerous both in principle and in practice and unless accompanied by a minimum protein intake, frequently ends in coma.

5. That undernutrition (a) prevents diabetes and (b) is the foundation stone of diabetic treatment. If hunger can be avoided a smaller number of patients will yield to temptation, break treatment, and in consequence die of coma.

6. That extreme inanition with loss of body protein is not worth while simply to render the blood sugar normal.

7. That acidosis, the chief cause of death in diabetes, is more easily prevented in ninety-nine cases than treated in one, and therefore diabetics when ill from any cause should (1) go to bed, (2) keep warm, (3) take a glass of hot water, tea, broth, orange juice, or oatmeal water-gruel every hour, (4) empty the bowels with an enema, (5) call a doctor who after a careful examination, if he finds acidosis the dominant factor, will give insulin and caffeine,

may wash out the stomach, and inject a subcutaneous solution of salt.

That gangrene, the other diabetic enemy, should be avoided by extreme cleanliness, care and exercise of the feet by all diabetics over 50 years of age.

8. That the immediate aim of practice should be to simplify treatment and to encourage physicians in their own communities to develop homes and boarding houses, clinics, or departments in hospitals to which they may take or refer their patients for a diabetic education.

9. That any patient with a tolerance of less than 100 grams of carbohydrate should (a) test his own urine for sugar, (b) keep sugar-free, and (c) take home food scales and use them until he can keep sugar-free without them, and eventually in the course of years raise his tolerance to this level with or without insulin.

10. That firm persistence in a strict diabetic diet (a) finds ample justification in the many patients kept alive by it to profit by insulin with its assurance of gain in weight, strength, and mental vigor; and (b) is essential to safety and success in the use of insulin. Insulin utilizes rather than replaces the advances in diabetic treatment hitherto achieved.

*Inauguration of Treatment*—The inauguration of treatment of a diabetic is a critical procedure. The doctor must never forget that the patient comes to him alive and whatever he does should give help and not cause harm. Two weeks have not passed since I was consulted about a patient who went into coma with the inauguration of treatment because of sudden restriction and alteration of diet.

Acidosis is practically the only danger which arises in the beginning of treatment. Every physician should have ingrained in him these three principles underlying diabetic coma: (1) Overeating tends to bring on coma. (2) It is immaterial whether the patient overeats food or whether he overeats himself. He does the latter when his metabolism is increased, as, for example, when he burns up with fever or has hyperthyroidism. (3) Coma comes when the carbohydrate burned in the body is insufficient to oxidize completely the protein and fat which are simultaneously metabolized. Consequently in the inauguration of treatment of a diabetic don't overfeed him. Protect him with food and protect him by rest against his own increased metabolism. Further, remember that temporarily it is safe to give a small quantity of protein and even less fat, because he can supply these from his own diabetic store as required. On the other hand, allow a moderate amount of carbohydrate which by its oxidation will burn the fat and protein too. No patient who is sugar-free and is taking 1 gram of protein per kilogram body weight will show acid, unless more than 3 grams of fat are oxidized for 1 gram of carbohydrate. If the patient on this diet is not sugar-free the protein should be lowered to two-thirds of a gram, and then it will be safe to give 4 and even 5 grams of fat for each gram of carbohydrate metabolized. This practical rule I have based on the original work of Woodyatt, Schaffer, Wilder and others.

If a diabetic showing large quantities of sugar is suddenly fasted he may go into coma, because his body store of carbohydrate in the form of glycogen

is so slight that it will not offset the protein and fat of his own body which he consumes. Fortunately he seldom goes into coma, simply because his diabetes is so mild that he becomes promptly sugar-free and does not use up his carbohydrate store.

Insulin or no insulin, inaugurate the treatment of diabetes gradually. There is no need for haste. The patient should live for years. The interval between the beginning of treatment and the hour of becoming sugar-free it is true can be shortened with insulin as much as one likes, but only when the patient is watched hour by hour.

If the patient can go to a hospital where he shares the *esprit de corps* of a group of diabetics he is fortunate. There are rare nurses who can inaugurate treatment successfully in the home, but unfortunately there are few of them and the cost is generally prohibitive.

Education of the diabetic begins his first day and should be of the kindergarten order. Don't overwhelm him with knowledge. Teach him the simplest things. He will learn enough as time goes on. However, during the first few days of treatment he must learn the danger of acidosis and how he can avoid it.

It was hard for Mary M. to stand up before the diabetic class and say the reason she went into diabetic coma was because she ate a banana royal and hot dogs, but the remembrance of that fact undoubtedly is partly responsible for our small number of deaths from coma last year. Again this year Mary went into coma and before she could recover from the same the patients in her ward volunteered the reason why. They knew because they saw, when her stomach was washed out, there were peanuts in the contents. There was no doubt in Mary's mind or in the patients' minds why acidosis came on. She is a good girl, but she eats too much, has become too fat, and some day even insulin may not overcome her indiscretions.

**Gangrene**—Infections of the feet and gangrene are among the saddest complications of the diabetic. If the patient is 50 years old he must realize that gangrene is a possibility. Not uncommonly I send a diabetic to the hospital even though the case is mild, not because of the trifling amount of sugar in the urine, but because I believe the education of the patient in the care of his feet may prevent a catastrophe. When I left the Deaconess Hospital a few days ago there were on my service in the hospital five patients with amputations of a leg and four with amputations of a toe. I consider the example which these patients presented to the others in the group of more value than words. This month represents the beginning of the establishment of a special department for the care of the feet of our diabetic patients after discharge. One might christen it a beauty parlor for diabetic feet. It is not our intention to open a chiropody department for diabetics generally, but we are making available for all our old patients a department to which they can return for the care of their feet. Already we have a dental department, but I suspect this new department for the feet will prove to be more life-saving in character. Particularly have we been led to this because many poor patients in the past have spent,

either of their own or of our funds, large sums of money on account of gangrene or infections of their feet. After discharge from the hospital slight infections have reoccurred and a re-entry has been necessary. Now we are arranging this so-called beauty parlor for the feet so that these patients can regularly report to us for foot inspection. In many patients the state of the diabetes is inconsequential when compared with the state of the feet.

**Insulin**—Insulin goes hand in hand with diet in the treatment of diabetes. Ordinarily I begin both simultaneously and gradually accustom the patient to both. It is desirable for most all diabetics to take insulin even though a considerable percentage can give it up after a few days or weeks. Insulin is the one drug that they ought to know about, and the sooner they become acquainted with it the better. It saves their time, saves their money, saves their life, and insulin is the one means we have today at our disposal which makes the health of the diabetic not only tolerable, but good. If he is able to give up insulin so much the better, because he tells another diabetic about it and this is encouraging news. If he understands about insulin he will know that it is likely to be necessary for him to employ it in the presence of an infection, whether general like pneumonia or local like a carbuncle. It is his staff which always must be ready when his progress becomes difficult. This evening it is out of place for me to discuss in detail indications for insulin, its dosage, dangers, or methods of application, because these will be considered in a Stanley Black lecture in Pasadena.

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**Fractures of Shaft of Femur**—W. K. West, Oklahoma City (*Journal A. M. A.*), gives the results of treatment in ten cases of fracture of the shaft of the femur in which adhesive traction in connection with a plaster spica was used. This is a modification of several methods. Immediately after the first roentgenogram has been taken, the patient is removed to the plaster room and placed on the traction table. The legs are pulled out to equal lengths. Adhesive strapping is applied to the leg in exactly the same manner as when the Thomas splint is used. The stockinet is then pulled up over the leg and the body. Sheet wadding is applied in the usual manner rather lightly. In addition, the back, ribs and pelvis are well padded with one-eighth inch harness felt. A spica is applied from nipple line to ankle. In small children, the cast is carried to the knee on the opposite leg. It is important that the margin of the cast around the lower back and inner side of the thigh will be well padded and the stockinet that turned back, giving a soft edge. The foot of the bed is elevated eight inches and a Balkan frame is placed over it. This frame is similar to the U. S. army standard. The top half of plaster is cut away from three inches above the knee to the end of the cast. There are two weights used, one suspending the leg in the plaster about six inches off the bed. This rope is carried through two pulleys overhead and one at the foot, so that the weight hangs off the bed below. The other pulley is attached to a cross piece about the level of the main axis of the leg after it has been properly suspended. The Sinclair skate board is used as the wooden block on the sole of the foot, which transmits the traction from the adhesive to the weight rope. The weights used are about sixteen pounds on the suspension and from twenty to thirty pounds on the traction, depending on the size of the patient. Handholds are attached to the frame directly over the patient's shoulders to help him move about in bed. This method is continued from four to six weeks; then a simple plaster spica, including the foot, is used for protection for four more weeks, and after that a caliper splint is used if it is thought necessary.